Minutes of spin meeting 10/24/07

Kevin presented a preliminary results on manipulating β_x with 17th harmonics correctors in the AGS. The aim is to change the horizontal beta function at the entrance of cold snake and reduce the horizontal resonance strength accordingly. The idea could be applied to the second half of the ramp, after transition. The 17th stopband correction is based on the coils of 12 turns/pole in four quads. The simulation is to see if the correctors are powerful enough for the purpose. To simplify the situation, the AGS MAD model does not include snake field maps as the snake effect on lattice is very small at high energies. With $\nu_x = 8.5014$ and $\nu_y = 8.98$, β_x can be reduced from 13m down to 4m. Waldo pointed out that such a set of tunes is close to the sum resonance $2\nu_x + \nu_y$ =integer. The vertical tune is going to be pushed toward integer above transition energy. Later Thomas pointed out that larger β_x actually reduces horizontal resonance strength. It is not hard to achieve, as the relative phase of the beta wave can be adjusted to get either β_x enhancement or reduction. The challenge is that this would requires to operate AGS with both ξ_x and ξ_y close to zero.

Fanglei showed her spin tracking following last week's discussion. As she tracked a particle with zero transverse emittance and no synchrotron motion, the spin coherence disappeared in the tracking. In last week's tracking, she put in an one-dimension $\Delta p/p$ Gaussian distribution (the distribution should be 2D in longitudinal space). The simulation showed the strange oscillation structure. Thomas suggested to check energy along the ramp for each particle, which seems caused the energy deviated from the synchronous particles over the ramp. Mei questioned which version of SPINK is used, as the synchrotron motion should have been fixed. But these spin trackings suggest that there are bugs in the longitudinal part of the SPINK code.

Haixin